

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
17 June 2004 (17.06.2004)

PCT

(10) International Publication Number
WO 2004/051388 A3

(51) International Patent Classification⁷: G05D 16/10

(21) International Application Number:
PCT/GB2003/005197

(22) International Filing Date: 2 December 2003 (02.12.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0228294.5 4 December 2002 (04.12.2002) GB

(71) Applicant (for all designated States except US): F.X.K. PATENTS LTD. [GB/GB]; The Old School House, Church Hill, Akeley, Buckinghamshire MK18 5HB (GB).

(72) Inventor; and

(75) Inventor/Applicant (for US only): KAY, Francis, Xavier [GB/GB]; The Old School House, Church Hill, Akeley, Buckinghamshire MK18 5HB (GB).

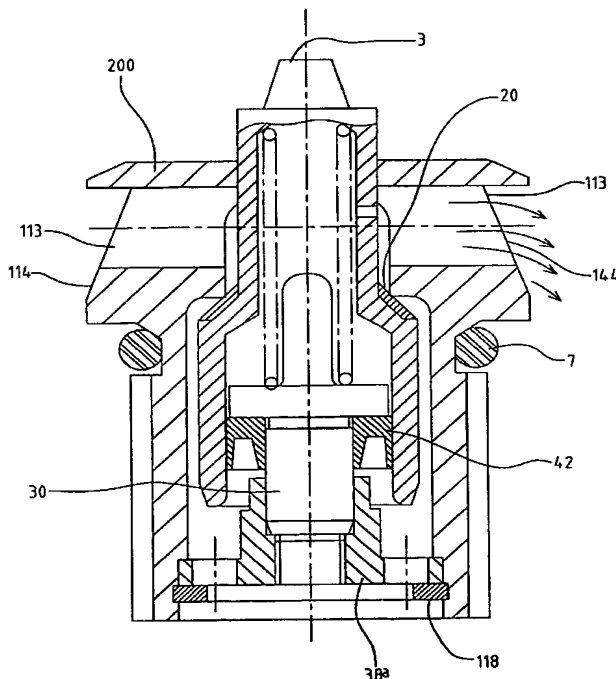
(74) Agent: CARSTAIRS, J., C.; Forrester Ketley & Co, Forrester House, 52 Bounds Green Road, London N11 2EY (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: IMPROVEMENTS IN OR RELATING TO VALVES



(57) Abstract: A valve module includes a valve housing (2) providing a chamber accommodating at least part of a valve member (3). The chamber forms part of a high pressure side of the valve. A valve port leads from the valve chamber to a low pressure side of the valve and the valve member co-operates with a valve seat around the valve port. The valve member is displaceable inwardly away from the valve seat to open the valve against a biasing spring biasing the valve member towards its closed position. The valve housing has on its low pressure side a shroud or wall (200) extending transversely with respect to the valve axis and spaced from the valve so as to deflect any gas exiting from the valve port in the direction parallel with the valve axis. The valve housing defines with the shroud or transverse wall (200) one or more transverse passages (113) leading to openings at the sides of the valve housing for the passage of gas issuing from the valve port.

WO 2004/051388 A3



Published:

— with international search report

(88) Date of publication of the international search report:

16 June 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

PCT/GB 03/05197

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G05D16/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G05D F16K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X, L	EP 1 262 402 A (F X K PATENTS LTD) 4 December 2002 (2002-12-04) column 4, lines 41-48; figure 5 Document invalidates priority claimed, since it discloses the subject-matter of claims 1-3, and was filed before application GBA0228294, from which the present application claims priority.	1-3
Y	GB 2 298 026 A (KAY FRANCIS XAVIER) 21 August 1996 (1996-08-21) the whole document	1, 2
Y	DE 19 60 320 A (CESKOSLOVENSKA AKADEMIE VED) 11 June 1970 (1970-06-11) figure 1	1, 2
	----- -/-- -----	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the International filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the International filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the International search

20 December 2004

Date of mailing of the International search report

08. 03. 2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Westholm, M

INTERNATIONAL SEARCH REPORT

PCT/GB 03/05197

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	FR 1 252 720 A (SPIROTECHNIQUE) 3 February 1961 (1961-02-03) page 2, lines 4-21; figures 1,2	1,2
Y	US 4 192 298 A (GASS JACQUES ET AL) 11 March 1980 (1980-03-11) column 5, line 59 - column 6, line 46; figure 3	1,2
A	DE 299 11 365 U (SCHIEFER ROLF) 23 September 1999 (1999-09-23) abstract; figures 1,2	1,2

INTERNATIONAL SEARCH REPORT

PCT/GB 03/05197

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

see annex

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-3

Valve with a shroud or wall for deflecting the gas flow from the outlet of the valve.

2. claim: 4

Valve with slits in the housing.

3. claims: 5-6

Valve with supporting insert designed for resilient inward flexing.

4. claims: 7-16

A sealing arrangement.

INTERNATIONAL SEARCH REPORT

Information on patent family members

PCT/GB 03/05197

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1262402	A	04-12-2002	AU 4064602 A EP 1262402 A2 US 2003000529 A1	05-12-2002 04-12-2002 02-01-2003
GB 2298026	A	21-08-1996	NONE	
DE 1960320	A	11-06-1970	CH 497659 A DE 1960320 A1	15-10-1970 11-06-1970
FR 1252720	A	03-02-1961	GB 901513 A	18-07-1962
US 4192298	A	11-03-1980	IT 1068162 B DE 2745795 A1 FR 2368081 A1 FR 2367655 A1 GB 1586716 A JP 53091299 A SE 7711473 A	21-03-1985 20-04-1978 12-05-1978 12-05-1978 25-03-1981 10-08-1978 14-04-1978
DE 29911365	U	23-09-1999	DE 29911365 U1	23-09-1999